Space Weather Forecast

Issued on Wednesday, 20 September 2023 at 01:29 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Chance of further G1-G2 minor/moderate storms Day 1 (20 Sep) as CME effects continue to wane. Isolated R1-R2 Minor/Moderate Radio Blackouts likely throughout.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity is Moderate over the past 24 hours, with four Moderate flares observed. The peak flares associated with the lager region in the east. There are currently eleven sunspot regions on the visible disc, with nine numbered. The largest and most active region on the disk is in the east, with continuing magnetic complexity visible. An active region in the northwest also remans of interest, with continued slight growth. The remaining regions are relatively unchanged with little activity, though a second as yet un-numbered region has developed quickly in the central-east disk in recent hours.

Two Moderate Class flare mentioned above look to have produced CMEs which are under assessment, with the first awaiting model output and the second available imagery.

Solar Wind / Geomagnetic Activity: Solar winds saw a slowly declining trend from a peak around 650km/s early in the period to current elevated values around 550km/s. The total magnetic field saw a decline early in the period back towards weak to moderate levels for much of the last 24hrs. The important north-south component showed a similar trend, increasing from a minimum of around to start, to vary weakly for much of the period. Geomagnetic activity was highly variable between Unsettled and G2 Moderate geomagnetic storm, and peaked at G3 Strong geomagnetic storm in the 19/0300-0600 UTC interval.

Energetic Particles / Solar Radiation: No solar radiation storms were observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is expected to be generally Moderate, with further isolated Moderate flares likely.

Solar Wind / Geomagnetic Activity: Current CME effects, increasingly though to be associated with the 16 Sep large filament (arc of plasma) lift off, look to be waning but are are expected to continue through Day 1 (20 Sep), increasingly easing into Day 2 (21 Sep). Fast wind influence likely late in the period. Generally Active geomagnetic activity expected at first, with a continued chance of further G1-G2 Minor to Moderate storms. CME effects likely easing into Day 2-3 (21-22 Sep) with generally Quiet to Unsettled conditions returning. Into late Day 3 and Day 4 (23 Sep) Unsettled to Active conditions becoming increasingly likely once again.

Energetic Particles / Solar Radiation: No solar radiation storms are expected, with only a slight chance of an enhancement should any larger flares occur, or perhaps early in the period in association with CME arrival.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	Yes	40	10	5	10
Strong	G3	Yes	5	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	Yes	60	60	60	60
Very Active	R3 to R5 X	No	5	5	5	5

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	10	5	5	5
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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